

**NOTICE OF FINAL RULEMAKING**

**MARICOPA COUNTY AIR POLLUTION CONTROL  
REGULATIONS REGULATION III – CONTROL OF AIR CONTAMINANTS**

**RULE 323: FUEL BURNING EQUIPMENT FROM  
INDUSTRIAL/COMMERCIAL/INSTITUTIONAL (ICI) SOURCES**

The Maricopa County Air Quality Department (MCAQD) revised Rule 323 (Fuel Burning Equipment from Industrial/Commercial/Institutional (ICI) Sources). The Control Officer is posting this Notice of Final Rulemaking on the MCAQD website as required by A.R.S. § 49-471.07(G). This notice includes the preamble, as prescribed in A.R.S. § 49-471.05, and the full text of the final rule. This notice also includes a list of all previous notices posted on the Maricopa County Enhanced Regulatory Outreach Program (EROP) website addressing the proposed rule and the concise explanatory statement prescribed in A.R.S. § 49-471.07, subsection B.

**PREAMBLE**

**1. Statutory authority for the rulemaking:**

A.R.S. §§ 49-112, 49-474, 49-479 and 49-480

**2. Name and address of department personnel with whom persons may communicate regarding the rulemaking:**

Name: Scott Kahldon or Kimberly Butler  
Maricopa County Air Quality Department  
Planning and Analysis Division

Address: 3800 N Central Avenue, Suite 1400  
Phoenix, AZ 85012

Telephone: 602-506-6010

Fax: 602-506-6179

Email: [AQPlanning@maricopa.gov](mailto:AQPlanning@maricopa.gov)

Submit Comments At: <http://maricopa.gov/FormCenter/Regulatory-Outreach-17/Citizen-Comments-94>

**3. Rulemaking process:**

This rulemaking (AQ-2017-007-Rule 323) followed procedures identified in state statutes and the Maricopa County EROP Policy:

County Manager Briefing:	December 2017
Stakeholder Workshops:	August 22, 2018 September 23, 2020
Board of Health Meeting to Initiate Regulatory Change:	February 25, 2019
Notice of Proposed Rulemaking:	November 24, 2020
Board of Health Meeting to Recommend Approval to the Board of Supervisors:	April 26, 2021

Board of Supervisors Formal Meeting to set the  
Public Hearing:

May 19, 2021

Board of Supervisors Public Hearing:

June 23, 2021

**4. Explanation of the rule, including the control officer's reasons for initiating the rulemaking:**

Rule 323 (Fuel Burning Equipment from Industrial/Commercial/Institutional (ICI) Sources) limits emissions of nitrogen oxides (NO<sub>x</sub>), sulfur oxides (SO<sub>x</sub>), carbon monoxide (CO), and particulate matter (PM) from fuel burning equipment at industrial, commercial, and institutional (ICI) sources. The MCAQD revised Rule 323 to address rule deficiencies identified by the U.S. Environmental Protection Agency (EPA) to secure full approval of Rule 323 as a revision to the Arizona State Implementation Plan (SIP).

On May 4, 2016, portions of Maricopa County were designated as a moderate nonattainment area with respect to the 2008 National Ambient Air Quality Standards for Ozone. Sections 182(b)(2) and 182(f) of the Clean Air Act require jurisdictions that are classified as “moderate” or higher nonattainment to implement reasonable available control technology (RACT) for all categories of volatile organic compound (VOC) sources covered by a Control Technique Guideline document as well as for all major stationary sources of NO<sub>x</sub> and VOCs that are located within the nonattainment area. EPA defines RACT as “the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility.” The EPA provides guidance on RACT for sources of NO<sub>x</sub> through Alternative Control Technology (ACT) documents which offer State and local air pollution control authorities information that assists in determining NO<sub>x</sub>-RACT for air quality rules. In addition, the EPA reviews SIP-approved air quality rules from other air districts with ozone nonattainment areas to assist in determining NO<sub>x</sub>-RACT for air quality rules.

In November 2016, Rule 323 was revised to implement RACT for sources of NO<sub>x</sub>. The revised rule was submitted to the EPA in June of 2017, as part of the SIP Revision for the Maricopa County Air Quality Department Ozone Rules contained in the Arizona SIP. The EPA reviewed Rule 323 and provided the MCAQD with written rule approvability and rule improvement comments for the rule. EPA staff informed MCAQD staff they would be using a conditional approval process to act on Rule 323 and the MCAQD would need to draft a commitment letter outlining revisions to Rule 323 to address the rule approvability comments.

On January 28, 2019, the MCAQD submitted a Letter of Commitment for Conditional Approval of the Maricopa County RACT SIP to the EPA. Based on the commitment letter, the EPA published a proposed conditional approval of Rule 323 in the Federal Register on December 30, 2019 (Docket ID; EPA-R09-OAR-2019-0321). The proposed conditional approval rulemaking was available for a 30-day comment period, but no comments were received. The proposed conditional approval referenced a Technical Support Document (TSD) which included a thorough review of Rule 323 and MCAQD’s commitments. The TSD outlined EPA’s eight (8) official rule approvability comments (“rule deficiencies”) - which precluded full approval of the rule into the SIP - as well as one (1) rule revision recommendation, which was not the basis for rule disapproval but was recommended for the rulemaking for Rule 323. Revisions addressing both the EPA’s identified deficiencies and

recommendation were made to Rule 323 (included in this notice). A link to EPA's TSD is located under Section 5 of this notice.

EPA's final conditional approval was published on July 20, 2020. The effective date of the final rule was August 19, 2020. The MCAQD plans to submit the revised rule to the EPA for approval and if the EPA approves the rule, the identified deficiencies will be cured, and the rule will be approved as part of the Arizona SIP.

Details about the EPA's identified deficiencies and the MCAQD's remedies are described below, followed by the EPA rule recommendation and the MCAQD's revisions to address the recommendation.

#### Deficiency 1:

The emergency fuel use exemptions in Section 104 are overly broad. To correct this, the MCAQD should clarify in this section that emergency fuel is only allowed under natural gas curtailments or natural gas emergencies. The MCAQD should further limit the total allowable length of emergency fuel burning to be consistent with other jurisdictions (see, Imperial County APCD Rule 400.1 Section D.3) Also, Rule 323 does not require that the facility owner/operator notify the MCAQD when switching to emergency fuel, which Rule 322 "Power Plant Operations" (which regulates similar types of combustion equipment) does. This is an enforceability issue. Finally, the language in section 104 exempting units firing emergency for testing purposes could be interpreted to allow for the exemption during any operating period so long as there was a testing period. The MCAQD should clarify that the exemptions only apply during the testing period.

#### Remedy 1:

The MCAQD corrected this deficiency by clarifying that exemptions for emergency fuel use only apply during natural gas curtailments and natural gas emergencies and for up to 36 cumulative hours per year for testing, reliability, training, and maintenance purposes. The MCAQD added a requirement for the owner or operator to notify the MCAQD when switching to emergency fuel. Also, the MCAQD limited the total allowable length of emergency fuel combustion during natural gas curtailments and natural gas emergencies to 168 hours per year per combustion unit (for combustion units located at a major stationary source of nitrogen oxides).

#### Deficiency 2:

All major sources of NO<sub>x</sub> must be subject to RACT limits or requirements. All turbines, and all boilers rated larger than 100 MMBtu/hr must comply with the limits in section 304. Boiler units rated between 10 MMBtu/hr and 100 MMBtu/hr may opt to comply with the limits in section 304, or tune the units annually as required in section 304.1. The burner maintenance requirements in section 304.1 are not RACT, as other jurisdictions regulating units in this size category are able to achieve numeric limits (down to 5 MMBtu/hr in Imperial County APCD Rule 400.2) or have more stringent tuning requirements (as seen in Ventura County APCD Rule 74.15.1 and South Coast AQMD Rule 1146, Attachment A). As the rule is written, major source units in the nonattainment area are only required to tune the engine instead of complying with a RACT NO<sub>x</sub> limit. MCAQD must clarify that larger units (e.g. annual heat input rating of 50 MMBtu/hr or greater, and annual heat input of

220,000 therms or greater) shall comply with Rule 323 by meeting a NO<sub>x</sub> limit (as seen in San Diego County APCD Rule 69.2).

Remedy 2:

The MCAQD extended the NO<sub>x</sub> emission limits to units greater than 50 MMBtu/hr for combustion units located at major sources of NO<sub>x</sub>. The MCAQD also required combustion units rated greater than 10 MMBtu/hour and less than or equal to 50 MMBtu/hr with annual heat input greater than or equal to 220,000 therms to comply with the RACT emission limits or RACT tuning procedures for combustion units located at major sources of NO<sub>x</sub>.

Deficiency 3:

The NO<sub>x</sub> limits of 42 ppmv for gas fuel-fired operations and 65 ppmv for liquid fuel-fired operations for non-turbine combustion equipment in this rule are not consistent with other jurisdictions limits and are not RACT. Limits in other ozone nonattainment jurisdictions, such as Imperial County APCD Rule 400.2 and Sacramento Metropolitan AQMD, are set 30 ppmv and 40 ppmv for gas and liquid fuel-fired operations.

Remedy 3:

The MCAQD added NO<sub>x</sub> emission limits for non-turbine combustion equipment of 30 ppmvd when burning gaseous fossil fuel and 40 ppmvd when burning liquid fossil fuel to meet RACT.

Deficiency 4:

Section 306 states that operators may comply with the limits in this rule by installing an ECS, and notes that such systems must be properly operated and maintained in accordance with an approved operations and maintenance plan. The rule language in section 306 could be interpreted to mean that the installation of an ECS on its own would allow compliance with the emission limits. However, an ECS that does not sufficiently reduce emissions could meet section 306's requirement without any verification for meeting the other section 300 requirements. The effectiveness of such a system in meeting the applicable emission standards is unknown without a compliance determination requirement (which in section 503 only applies to sections 301-304, and only for units larger than 100 million Btu/hr). MCAQD must include language that states that an ECS or combustion control system must also be source tested to confirm compliance with the limit or create parametric monitoring requirements to put in the operation and maintenance plan. Alternatively, the rule language in section 306 should be clarified to not allow for the installation of an ECS to be an alternative to compliance with the RACT limits in sections 301-304.

Remedy 4:

The MCAQD revised Section 503.2 to require performance testing for any unit that is subject to numeric emission limits in Section 301, 304 and/or 305. In addition, the MCAQD added Section 307.2.d to require an O&M plan to contain operating parameters to ensure the owner or operator continues to operate the ECS in the manner it was operated during the performance test.

Deficiency 5:

The operations and maintenance plan requirements are only approved by the Control Officer in section 306.3. This constitutes unacceptable director's discretion. In addition, the rule allows the facility operator to change the operation and maintenance plan in section 306.3.d by submitting changes. MCAQD must revise this language to resolve these enforceability questions, either by removing this discretion, including the EPA in approval of these plans, or outlining clear criteria that must be met for approval. The operation and maintenance plan must include the control equipment manufacturer's operation and maintenance guidelines. If the MCAQD chooses to revise section 306 so that installation of an emission control system does not result in automatic compliance with the emission limits in sections 301-304, then this discretion may be acceptable as a source test would be the primary determinant of compliance with RACT requirements.

Remedy 5:

The MCAQD added Section 307.2 which outlines clear criteria that must be included in an O&M plan for approval by the Control Officer and also states that the O&M Plan must include the manufacturer's recommended maintenance procedures and frequencies. In addition, the MCAQD revised Section 503 requiring performance tests for any units that are subject to a numeric emission limit.

Deficiency 6:

Section 503.2 specifies that boilers larger than 100 MMBtu/hr must source test triennially but does not describe a testing frequency for other units. Other units must be tested at least triennially. MCAQD must also cite the appropriate test method from the list in section 500.

Remedy 6:

The MCAQD revised Section 503.2 to require any combustion unit that is subject to numeric emission limits in Section 301, 304 and/or 305 to conduct performance tests at least once every 5 years. In addition, MCAQD added citations of the appropriate test methods in sections 503.2.a and 503.2.b.

Deficiency 7:

Section 200 of this rule and Maricopa's Rule 100 General Provisions and Definitions does not include a definition for "boiler," which is used throughout this rule, and in the context of definitions for "annual capacity factor," "steam generating unit," and others. For purposes of enforceability, such a definition is necessary.

Remedy 7:

The MCAQD added a definition of "boiler".

Deficiency 8:

Section 200 also does not include a definition for "continuous emissions monitoring system." For purposes of enforceability, such a definition is necessary.

Remedy 8:

The MCAQD added a definition of “continuous emissions monitoring system”.

Recommendation 1:

Section 219 defines “steady state” This is defined as a “safe stable megawatt load”, which is the incorrect measure for non-EGU sources like general ICI sources which may not output power in megawatts.

Revision 1:

The MCAQD removed the definition of “steady state”.

**5. Studies relied on in the control officer's evaluation of or justification for the rule and where the public may obtain or review the studies, all data underlying the studies, any analysis of the studies and other supporting material.**

United States Environmental Protection Agency Region IX Air Division (2019), Technical Support Document for EPA’s Rulemaking for the Arizona State Implementation Plan Regarding Rule 323, “Fuel Burning Equipment from Industrial/Commercial/Institutional (ICI) Sources.”

<https://www.regulations.gov/document?D=EPA-R09-OAR-2019-0321-0011>

**6. An economic, small business and consumer impact statement:**

The following discussion addresses each of the elements required for an economic, small business and consumer impact statement, as prescribed by A.R.S. §§ 41-1055, subsections A, B and C, and 41-1035:

**An identification of the rulemaking, including all of the following:**

This rulemaking revised Rule 323.

**(a) The conduct and its frequency of occurrence that the rule is designed to change.**

The MCAQD revised Rule 323 to remedy deficiencies identified by the EPA. This rulemaking is required to secure approval of Rule 323 into the Arizona SIP. The revisions are explained in more detail in Item #4 of this notice.

**(b) The harm resulting from the conduct the rule is designed to change and the likelihood it will continue to occur if the rule is not changed.**

The MCAQD revised Rule 323 to remedy deficiencies identified by the EPA. This rulemaking is required to secure approval of Rule 323 into the Arizona SIP and avoid sanctions and imposition of a Federal Implementation Plan (FIP) under the Clean Air Act.

**(c) The estimated change in frequency of the targeted conduct expected from the rule change.**

The MCAQD revised Rule 323 to remedy deficiencies identified by the EPA. This rulemaking is required to secure approval of Rule 323 into the Arizona SIP. As with other rules, the MCAQD will use education, outreach, and other compliance assurance tools to increase the number of people in compliance with the revised rule. The MCAQD strives to achieve the highest possible compliance rates.

**A brief summary of the information included in the economic, small business and consumer impact statement.**

The economic, small business and consumer impact statement addresses each of the elements required for an economic, small business and consumer impact statement, as prescribed by A.R.S. §§ 41-1055, subsections A, B, and C, and 41-1035.

**Name and address of agency employees who may be contacted to submit or request additional data on the information included in the economic, small business and consumer impact statement.**

Name: Scott Kahldon or Kimberly Butler  
Maricopa County Air Quality Department  
Planning and Analysis Division

Address: 3800 N Central Avenue, Suite 1400  
Phoenix, AZ 85012

Telephone: 602-506-6010

Fax: 602-506-6179

Email: [AQPlanning@maricopa.gov](mailto:AQPlanning@maricopa.gov)

Submit Comments At: <http://maricopa.gov/FormCenter/Regulatory-Outreach-17/Citizen-Comments-94>

**An identification of the persons who will be directly affected by, bear the costs of or directly benefit from the rulemaking.**

This rulemaking will directly affect industrial, commercial, and institutional sources in Maricopa County with combustion units that meet the applicability thresholds below:

- (1) Each boiler or steam generating unit that has a maximum design rated heat input capacity greater than 10 million (MM) British thermal units per hour (Btu/hr),
- (2) Each stationary gas turbine with a heat input at peak load equal to or greater than 10 MMBtu/hr,
- (3) Each co-generation steam generating unit with a heat input of greater than 10 MMBtu/hr, and
- (4) Each indirect-fired process heater with a heat input greater than 10 MMBtu/hr.

**A cost benefit analysis of the following:**

**(a) The probable costs and benefits to the implementing agency and other agencies directly affected by the implementation and enforcement of the rulemaking.**

This rulemaking should not impose any new costs on the MCAQD or on any other agencies affected by the rulemaking.

**(b) The probable costs and benefits to a political subdivision of this state directly affected by the implementation and enforcement of the rulemaking.**

This rulemaking should not impose any significant new costs on political subdivisions of this state affected by the rulemaking.

**(c) The probable costs and benefits to businesses directly affected by the rulemaking, including any anticipated effect on the revenues or payroll expenditures of employers who are subject to the rulemaking.**

The MCAQD revised Rule 323 to remedy deficiencies identified by the EPA. This rulemaking is required to secure approval of Rule 323 into the Arizona SIP for RACT and avoid sanctions and imposition of a FIP under the Clean Air Act. This rulemaking should not impose any significant new costs on businesses affected by the rulemaking. The MCAQD anticipates that increased clarity provided by the Rule 323 revisions will provide a benefit to the regulated community; it will take less time for sources subject to the rule to understand and comply with the rule, which leads to increased compliance, and a decrease in costs of compliance to the regulated community.

**A general description of the probable impact on private and public employment in businesses, agencies and political subdivisions of this state directly affected by the rulemaking.**

This rulemaking should have no impact on private or public employment in businesses, agencies, and political subdivisions of this state.

**A statement of the probable impact of the rulemaking on small businesses. The statement shall include:**

**(a) An identification of the small businesses subject to the rulemaking.**

Small businesses subject to this rulemaking are industrial, commercial, and institutional sources in Maricopa County that have fuel burning equipment that meet the requirements of Section 102 of the rule included in this notice.

**(b) The administrative and other costs required for compliance with the rulemaking.**

The MCAQD revised Rule 323 to remedy deficiencies identified by the EPA. This rulemaking is required to secure approval of Rule 323 into the Arizona SIP for RACT and avoid sanctions and imposition of a FIP under the Clean Air Act.

The MCAQD does not anticipate the rule revisions will impose any significant new costs on small businesses subject to this rule.

**(c) A description of the methods that the agency may use to reduce the impact on small businesses.**

**i. Establish less stringent compliance or reporting requirements in the rule for small businesses.**

This rulemaking does not impose any significant new compliance requirements on small businesses and does not establish any significant new reporting requirements for small businesses.

**ii. Establish less stringent schedules or deadlines in the rule for compliance or reporting requirements for small businesses.**

This rulemaking does not impose any significant new compliance requirements on small businesses and does not establish any significant new reporting requirements for small businesses.

**iii. Consolidate or simplify the rule's compliance or reporting requirements for small businesses.**

This rulemaking does not impose any significant new compliance requirements on small businesses and does not establish any significant new reporting requirements for small businesses.

**iv. Establish performance standards for small businesses to replace design or operational standards in the rule.**

This rulemaking is unlikely to impose any new design or operational requirements on small businesses.

**v. Exempt small businesses from any or all requirements of the rule.**

This rulemaking does not impose any significant new requirements on small businesses.

**(d) The probable cost and benefit to private persons and consumers who are directly affected by the rulemaking.**

This rulemaking should not result in any significant costs for private persons and consumers.

**A statement of the probable effect on state revenues.**

The rulemaking will not impose increased monetary or regulatory costs on other state agencies, political subdivisions of this state, persons, or individuals so regulated. Without costs to pass through to customers, there is no projected change in consumer purchase patterns and, thus, no impact on state revenues from sales taxes.

**A description of any less intrusive or less costly alternative methods of achieving the purpose of the rulemaking, including the monetizing of the costs and benefits for each option and providing the rationale for not using nonelected alternatives.**

The purpose of this rulemaking was to revise Rule 323 to remedy deficiencies identified by the EPA. This rulemaking is required to secure approval of Rule 323 into the Arizona SIP for RACT and avoid sanctions and imposition of a FIP under the Clean Air Act.

**A description of any data on which a rule is based with a detailed explanation of how the data was obtained and why the data is acceptable data.**

Not applicable.

**7. The effective date of the rule:**

The effective date of this rulemaking was June 23, 2021.

**8. Such other matters as are prescribed by statute and that are applicable to the county or to any specific rule or class of rules:**

Under A.R.S. § 49-479(C), a county may not adopt a rule or ordinance that is more stringent than the rules adopted by the Director of the Arizona Department of Environmental Quality (ADEQ) for similar sources unless it demonstrates compliance with the applicable requirements of A.R.S. §49-112.

§ 49-112 County regulation; standards

§ 49-112(A)

When authorized by law, a county may adopt a rule, ordinance or regulation that is more stringent than or in addition to a provision of this title or rule adopted by the director or any board or commission authorized to adopt rules pursuant to this title if all of the following requirements are met:

1. The rule, ordinance or regulation is necessary to address a peculiar local condition.
2. There is credible evidence that the rule, ordinance or regulation is either:
  - (a) Necessary to prevent a significant threat to public health or the environment that results from a peculiar local condition and is technically and economically feasible.
  - (b) Required under a federal statute or regulation or authorized pursuant to an intergovernmental agreement with the federal government to enforce federal statutes or regulations if the county rule, ordinance or regulation is equivalent to federal statutes or regulation.
3. Any fee or tax adopted under the rule, ordinance or regulation does not exceed the reasonable costs of the county to issue and administer the permit or plan approval program.

§ 49-112(B)

When authorized by law, a county may adopt rules, ordinances or regulations in lieu of a state program that are as stringent as a provision of this title or rule adopted by the director or any board or commission authorized to adopt rules pursuant to this title if the county demonstrates that the cost of obtaining permits or other approvals from the county will approximately equal or be less than the fee or cost of obtaining similar permits or approvals under this title or any rule adopted pursuant to this title. If the state has not adopted a fee or tax for similar permits or approvals, the county may adopt a fee when authorized by law in the rule, ordinance or regulation that does not exceed the reasonable costs of the county to issue and administer that permit or plan approval program.

The MCAQD is in compliance with A.R.S. §§ 49-112 (A) and (B). Rule 323 meets A.R.S. § 49-112 (A) (1) by demonstrating that the rule is necessary to address a peculiar local condition, in that Maricopa County fails to meet the 8-hour NAAQS for ozone. Rule 323 meets the requirements of A.R.S. § 49-112 (A) (2) (b), in that Maricopa County is required by federal law to revise existing rules to address RACT for industrial, commercial, and institutional sources that have fuel burning equipment. As there is no new fee or tax associated with this rulemaking, the MCAQD also affirms that Rule 323 meets the requirements of A.R.S. § 49-112 (A) (3) and A.R.S. § 49-112 (B).

**9. List of all previous notices posted to the Maricopa County EROP website addressing the rule and a concise explanatory statement, as prescribed by A.R.S. § 49-471.07, subsection B:**

**(a) List of all previous notices posted to the Maricopa County EROP website addressing the rule:**

Notice

Briefing Notification to County Manager:

Date of Posting

January 26, 2018

Notice of Stakeholder Workshop:	August 03, 2018 September 09, 2020
Notice of Board of Health Meeting to Initiate Regulatory Change:	February 08, 2019
Notice of Proposed Rulemaking:	November 24, 2020
Notice of Board of Health Meeting to Make Recommendations to the Board of Supervisors:	April 12, 2021
Notice of Public Hearing	May 19, 2021

**(b) The following discussion addresses each of the elements required for a concise explanatory statement, as prescribed by A.R.S. § 49-471.07, subsection B:**

**i. A description of any change between the proposed rule or ordinance, the final rule or ordinance or notice of final supplemental rule or ordinance.**

The following changes were made after the Notice of Proposed Rulemaking was published on November 24, 2020.

1. The MCAQD revised the definition of Parts Per Million By Volume Dry (PPMVD) to be consistent between Rules 322, 323, and 324. The section was revised as indicated below:

Section 219: PARTS PER MILLION BY VOLUME DRY(PPMVD): A unit of proportion used to express concentration that is corrected to a dry basis.

2. Based off of staff comments, the MCAQD removed the oxygen corrections “corrected to 15% oxygen” and “corrected to 3% oxygen” from the definition of Parts Per Million By Volume Dry and placed them closer to the corresponding emission limits to improve rule clarity. Section 304.2 and Section 305 were revised as indicated below:

Section 304.2: RACT Emission Limits: Limit nitrogen oxide emissions to no more than the following amounts:

a Stationary Gas Turbines:

- (1) 42 ppmvd corrected to 15% oxygen calculated as nitrogen dioxide, when burning gaseous fuel.
- (2) 65 ppmvd corrected to 15% oxygen calculated as nitrogen dioxide, when burning liquid fuel.

b. All Combustion Units Except Stationary Gas Turbines:

- (1) 30 ppmvd corrected to 3% oxygen calculated as nitrogen dioxide, when burning gaseous fuel.
- (2) 40 ppmvd corrected to 3% oxygen calculated as nitrogen dioxide, when burning liquid fuel.

Section 305: LIMITATIONS-CARBON MONOXIDE: An owner or operator of any combustion unit with a heat input greater than 100 MMBtu/hr shall not cause to be discharged into the atmosphere, carbon monoxide (CO), measured in excess of 400 ppmvd corrected to 15% oxygen for Stationary Gas Turbines, and

corrected to 3% oxygen for all Combustion Units Except Stationary Gas Turbines.

3. The MCAQD removed the language “in accordance with the requirements of Rule 270 of these rules” in section 503.2. The section was revised as indicated below:

Section 503.2: Source Test Requirements: The owner or operator of any combustion unit that is subject to numeric emission limits in Section 301, 304 and/or 305 of this rule shall conduct performance tests at least once every 5 years. The result of the performance test shall be the arithmetic mean of the results of three test runs. Each test run shall have a minimum sample time of one hour. In addition, the owner or operator shall comply with the following requirements:

4. Based off of staff comments, the MCAQD added the language “Monthly records” in section 501.1 and added the language “and amount” in section 501.2 to clarify tracking fuel use and standardizing language between the two sections. Section 501.1 and Section 501.2 were revised as indicated below:

501.1: Combustion Units: Monthly records of type and amount of fuel used, and the sulfur content of any liquid fuel or waste derived fuel gas combusted.

501.2: Emergency Fuel Usage: Monthly records of type and amount of emergency fuel used, the sulfur content of the fuel, dates and hours of operation using emergency fuel, and nature of the emergency or purpose for the use of the emergency fuel as stated in Sections 104.2 and 104.3. Yearly records of the twelve month log of hours of operation using emergency fuel.

**ii. A summary of the comments and arguments for and against the notice and the county’s response to the comments and arguments.**

The following discussion evaluates the arguments for and against the rule and includes responses to comments received on the rule or the preamble in the Notice of Proposed Rulemaking. The MCAQD received written comments from two (2) stakeholders. All of the comments were reviewed and evaluated by the MCAQD.

**Comment #1:** This rule contains similar requirements for tracking fuel use and days/hours of operation. I would like to request the same change as stated above (for R322, section 501.1 - This rule now requires records of the type and amount of fuel used, sulfur content and days and hours of operation. I would like to remove the requirement to track days and hours of operation and that fuel use be required to be tracked monthly. Fuel tracking monthly makes the most sense since invoices are typically sent monthly (in the case of natural gas). I have been unable to identify a reason to track days and hours of operation. This information does not appear to be needed to determine compliance).

**Response #1:** The MCAQD considered your comment and deleted the requirement for days and hours of operation. In addition, the MCAQD clarified that fuel usage be tracked monthly.

**Comment #2:** In Maricopa County’s (the County) workshop presentation, the County recommends accepting the more stringent boiler tuning requirements and suggests requirements based rated capacity and whether or not the source was at a major source. Concerning the County’s recommendations for altering requirements based on rated capacity of the unit, APS suggests an alternative. APS has reviewed EPA’s comment and believe EPA was intending to apply RACT to “major source units” (units emitting 100 tons/yr of NOx) and not a minor source unit at a “major source” as suggested by the County’s proposed commitment. APS requests that RACT requirements only apply to major source units. Applying a major source applicability limit would be consistent with EPA’s recommendation with Rule 322. APS owns a Clayton Boiler rated at 11 MBtu/hr, which emits approximately 25 lbs per year. APS has reviewed the examples for boiler tuning requirements and find them excessive in some situations for simple and small units. Multiple items in the referenced boiler tuning requirements could not work for this unit. APS doesn't support more stringent requirements for the smaller units. At a minimum, there should be language that accommodate the size and design of the unit.

**Response #2:** The MCAQD considered your comment and developed a table that clearly outlines which combustion units at a major source of NOx must comply with RACT requirements, see Table 323-1 in the rule. Some smaller combustion units, units greater than 10 MMBtu/hour and less than or equal to 50 MMBtu/hour with annual heat input less than 220,000 therms, will not have to comply with RACT requirements.

**EXACT WORDING OF THE RULE**

**MARICOPA COUNTY  
AIR POLLUTION CONTROL REGULATIONS  
REGULATION III – CONTROL OF AIR CONTAMINANTS**

**RULE 323  
FUEL BURNING EQUIPMENT FROM  
INDUSTRIAL/COMMERCIAL/INSTITUTIONAL (ICI) SOURCES**

**INDEX**

**SECTION 100 – GENERAL**

- 101 PURPOSE
- 102 APPLICABILITY
- 103 EXEMPTIONS
- 104 PARTIAL EXEMPTIONS

**SECTION 200 – DEFINITIONS**

	201	ALTERNATIVE FUELS
	<u>202</u>	<u>ANNUAL HEAT INPUT</u>
	<u>203</u>	<u>BOILER</u>
<del>202</del>	<u>204</u>	COGENERATION STEAM GENERATING UNIT
	<u>205</u>	<u>COMBUSTION CONTROL SYSTEM</u>
	<u>206</u>	<u>COMBUSTION UNIT</u>
	<u>207</u>	<u>CONTINUOUS EMISSIONS MONITORING SYSTEM (CEMS)</u>
<del>203</del>	<u>208</u>	CORRECTIVE ACTION PLAN (CAP)
	<del>204</del>	<del>DISTILLATE OIL</del>
<del>205</del>	<u>209</u>	EMERGENCY FUEL
<del>206</del>	<u>210</u>	EMISSION CONTROL SYSTEM (ECS)
<del>207</del>	<u>211</u>	FOSSIL FUEL
	<u>212</u>	<u>GAS TURBINE</u>
<del>208</del>	<u>213</u>	HEAT INPUT
	<u>214</u>	<u>LOW SULFUR OIL</u>
<del>209</del>	<u>215</u>	NATURAL GAS CURTAILMENT
<del>210</del>	<u>216</u>	OPACITY
	<u>217</u>	<u>OPERATING HOUR</u>
<del>211</del>	<u>218</u>	PARTICULATE MATTER EMISSIONS
	<u>219</u>	<u>PARTS PER MILLION BY VOLUME DRY (PPMVD)</u>
<del>212</del>	<u>220</u>	PEAK LOAD
<del>213</del>	<u>221</u>	PROCESS HEATER
<del>214</del>	<u>222</u>	RATED HEAT INPUT CAPACITY
	<del>215</del>	<del>REGENERATIVE CYCLE GAS TURBINE</del>
	<del>216</del>	<del>RESIDUAL OIL</del>
	<del>217</del>	<del>SIMPLE CYCLE GAS TURBINE</del>
<del>218</del>	<u>223</u>	STATIONARY GAS TURBINE
	<del>219</del>	<del>STEADY STATE</del>
<del>220</del>	<u>224</u>	STEAM GENERATING UNIT
<del>221</del>	<u>225</u>	SULFUR OXIDES (SO <sub>x</sub> )
<del>222</del>	<u>226</u>	ULTRA LOW SULFUR <u>OIL</u> <del>DIESEL</del>
<del>223</del>	<u>227</u>	UNCOMBINED WATER
<del>224</del>	<u>228</u>	WASTE DERIVED FUEL GAS

225            229    WATER HEATER

**SECTION 300 – STANDARDS**

301    LIMITATIONS - PARTICULATE MATTER

302    LIMITATIONS - OPACITY

303    LIMITATIONS - SULFUR IN FUEL

304    LIMITATIONS - NITROGEN OXIDES

305    LIMITATIONS - CARBON MONOXIDE

306    GOOD COMBUSTION PRACTICES FOR STATIONARY GAS TURBINES

306    307    REQUIREMENTS FOR AIR POLLUTION CONTROL EQUIPMENT ECS  
AND ECS MONITORING EQUIPMENT

308    EMERGENCY FUEL USE NOTIFICATION

**SECTION 400 – ADMINISTRATIVE REQUIREMENTS**

401    COMPLIANCE SCHEDULE FOR PERFORMANCE TESTING

402    COMPLIANCE SCHEDULE FOR RACT TUNING PROCEDURE

**SECTION 500 – MONITORING AND RECORDS**

501    RECORDKEEPING AND REPORTING

502    RECORDS RETENTION

503    COMPLIANCE ~~DETERMINATION~~ DEMONSTRATION

504    COMPLIANCE DETERMINATION-TEST METHODS INCORPORATED BY  
REFERENCE

**APPENDIX A TO RULE 323**

**MARICOPA COUNTY  
AIR POLLUTION CONTROL REGULATIONS  
REGULATION III-CONTROL OF AIR CONTAMINANTS**

**RULE 323**

**FUEL BURNING EQUIPMENT FROM INDUSTRIAL/COMMERCIAL/INSTITUTIONAL (ICI)  
SOURCES**

**SECTION 100 – GENERAL**

- 101 PURPOSE:** To limit the discharge of nitrogen oxides, sulfur oxides, carbon monoxide, and particulate matter emissions into the atmosphere from fuel burning combustion ~~equipment~~ units at industrial and/or commercial and/or institutional (ICI) sources.
- 102 APPLICABILITY:** This rule applies to the following types of ~~ICI combustion equipment~~ units that ~~burns~~ burn either fossil fuels or alternative fuels:
- 102.1** Each boiler or steam generating unit that has a maximum design rated heat input capacity ~~from fuels combusted in the generating unit of~~ greater than 10 million (MM) British thermal units per hour (Btu/hr)~~(2.9 Megawatts (MW))~~.
- 102.2** Each stationary gas turbine with a heat input at peak load equal to or greater than ~~2.9 megawatts (MW)~~ 10 MMBtu/hr.
- 102.3** Each cogeneration steam generating unit with a heat input of greater than 10 MMBtu/hr.
- 102.4** Each indirect-fired process heater with a heat input greater than 10 MMBtu/hr.
- 102.5** NSPS & NESHAP: In addition to this rule, facilities may be subject to New Source Performance Standards (NSPS) in Rule 360 and/or National Emission Standards for Hazardous Air Pollutants (NESHAP) in Rule 370 of these rules.
- 103 EXEMPTIONS:** This rule shall not apply to the following types of equipment:
- 103.1** Incinerators, crematories, or burn-off ovens; or
- 103.2** Dryers, cement, and lime kilns; or
- 103.3** Direct-fired process heaters; or
- 103.4** Medical waste incinerators; or
- 103.5** Reciprocating internal combustion ~~equipment~~ engines; or
- 103.6** Combustion equipment used in power plant operations for the purpose of supplying greater than one third of the electricity to any utility power distribution system for sale; or
- 103.7** Combustion equipment associated with nuclear power plant operations; or
- 103.8** Water heaters used for the sole purpose of heating ~~hot~~ water for comfort or for radiant heat; or

103.9 Municipal solid waste landfill enclosed combustors and non-enclosed flares.

**104 PARTIAL EXEMPTIONS:**

**104.1** Stationary gas turbines listed in Section 102.2 of this rule that are used for any of the following reasons shall be exempt from Sections ~~301.1, 301.2, 301,~~ 304, and 305, ~~501.1, and 501.3~~ of this rule:

- a. Used for firefighting; or
- b. Used for flood control; or
- c. Engaged by manufacturers in research and the development of equipment for either gas turbine emission control techniques or gas turbine efficiency improvements; ~~or.~~
- d. ~~Fired with emergency fuel that is normally fired with natural gas, or~~
- e. ~~Fired with emergency fuel for 36 cumulative hours per year or less, per unit for testing, reliability, training, and maintenance purposes as allowed by a permit issued by the Control Officer for that source.~~

**104.2** ~~All steam generating units including cogeneration units and process heaters~~ All combustion units that are normally fired with natural gas that are used for any of the following reasons as allowed by a permit issued by the Control Officer shall be exempt from Sections 301, 304, 305, and 501.1 and 501.3 of this rule: while firing emergency fuel during a natural gas curtailment or a natural gas emergency. For combustion units located at a major stationary source of nitrogen oxides, this exemption shall not exceed 168 hours per calendar year per combustion unit, excluding hours of operation for testing, reliability, training, and maintenance.

- a. ~~Fired with an emergency fuel that is normally fired with natural gas; or~~
- b. ~~Firing any emergency fuel for testing, reliability, and maintenance purposes for 36 cumulative hours per year, per unit or less.~~

**104.3** All combustion units that are normally fired with natural gas shall be exempt from Sections 301, 304, 305, and 501.1 of this rule while firing emergency fuel for the purposes of testing, reliability, training, and maintenance. This exemption shall not exceed 36 hours per calendar year per combustion unit, excluding hours of operation during natural gas curtailments and natural gas emergencies.

**SECTION 200 – DEFINITIONS:** For the purpose of this rule, the following definitions shall apply, in addition to those definitions found in Rule 100 (General Provisions and Definitions) of these rules. In the event of any inconsistency between any of the Maricopa County air pollution control rules, the definitions in this rule take precedence.

**201 ALTERNATIVE FUELS:** Substitutes for traditional oil-derived and fossil-fuel derived motor vehicle fuels including but not limited to biodiesel, propane, ethanol, ~~or~~ methanol, or waste derived fuel gas.

**202 ANNUAL HEAT INPUT:** The actual total heat input of fuels combusted in a unit during a calendar year, as calculated based on the amount of each fuel combusted and the higher heating value of each fuel. Annual heat input shall not include the heat input from

emergency fuel combusted during natural gas curtailments and natural gas emergencies or emergency fuel combusted for purposes of testing, reliability, training, and maintenance as long as the usage limits in Sections 104.2 and 104.3 are not exceeded.

**203** **BOILER:** A device that combusts any fossil fuel or alternative fuel and recovers thermal energy to heat water or another material.

**202** **204** **COGENERATION STEAM GENERATING UNIT:** A steam or hot water generating unit Any device that is fired with fossil fuels or alternative fuels and simultaneously produces both useful thermal energy (such as heat or steam) and either electrical (or mechanical energy) and thermal energy (such as heat or steam) from the same primary energy source.

**205** **COMBUSTION CONTROL SYSTEM:** Equipment or technology, such as water injection or low-NO<sub>x</sub> burners, that reduce the formation of nitrogen oxides during combustion of fossil fuels or alternative fuels.

**206** **COMBUSTION UNIT:** Any boiler, steam generating unit, stationary gas turbine, cogeneration steam generating unit, or indirect-fired process heater listed in Section 102 of this rule.

**207** **CONTINUOUS EMISSIONS MONITORING SYSTEM (CEMS):** The total equipment required to sample, analyze, measure, and provide a permanent record of emissions by means of readings recorded at least once every 15 minutes (using an automated data acquisition and handling system (DAHS)).

**203** **208** **CORRECTIVE ACTION PLAN (CAP):** A methodical procedure that is used to evaluate and correct a turbine operational problem and that includes, at a minimum, improved preventative maintenance procedures, improved ECS operating practices, possible operational amendments, and progress reports.

**204** ~~DISTILLATE OIL:~~ A petroleum fraction of fuel oil produced by distillation that complies with the specifications for fuel oil numbers 1 or 2, as defined by the American Society for Testing and Materials in ASTM D396-01, "Standard Specification for Fuel Oils."

**205** **209** **EMERGENCY FUEL:** Fuel fired by a gas combustion unit, normally fueled by natural gas, only during circumstances of unforeseen disruption or interruption in the supply of natural gas to a unit that normally runs on natural gas. The inability to burn natural gas may be one of the following, but is not limited to, natural gas emergency, natural gas curtailment, or a breakdown of the delivery system. Fuel fired only for purposes of testing, reliability, training, and maintenance or during circumstances such as a natural gas emergency or a natural gas curtailment, or breakdown of delivery system such as an unavoidable interruption of supply that makes it impossible to fire natural gas in the combustion unit. Fuel is not considered emergency fuel if it is used to avoid either peak demand charges or high gas prices during on-peak price periods or due to a voluntary reduction in natural gas usage.

**206** **210** **EMISSION CONTROL SYSTEM (ECS):** A system approved in writing by the Control Officer, designed and operated in accordance with good engineering practice to reduce emissions. Post-combustion systems that are approved in writing by the Control Officer and are designed and operated in accordance with good engineering practice to reduce emissions

from combustion equipment. A combustion control system is not an emission control system.

207 **211** **FOSSIL FUEL:** Naturally occurring carbonaceous substances from the ground such as natural gas, petroleum, coal, and any form of solid, liquid or gaseous fuel derived from such material for the purpose of creating energy.

**212** **GAS TURBINE:** A rotary engine driven by the expansion of hot gases that are generated by the combustion of fuel.

208 **213** **HEAT INPUT:** Heat derived from the combustion of fuel not including the heat input from preheated combustion air, recirculated flue gases, or exhaust gases from other sources, such as gas turbines, internal combustion engines, and kilns.

**214** **LOW SULFUR OIL:** Fuel oil containing less than or equal to 0.05% sulfur by weight.

209 **215** **NATURAL GAS CURTAILMENT:** A shortage in the supply of natural gas, due solely to limitations or restrictions in distribution pipelines by the utility supplying the gas and not due to the cost of natural gas.

210 **216** **OPACITY:** A condition of the ambient air, or any part thereof, in which an air contaminant partially or wholly obscures the view of an observer.

**217** **OPERATING HOUR:** A clock hour during which a unit combusts fuel, either for part of the hour or for the entire hour.

211 **218** **PARTICULATE MATTER EMISSIONS:** Any and all particulate matter emitted to the ambient air as measured by applicable state and federal test methods.

**219** **PARTS PER MILLION BY VOLUME DRY (PPMVD):** A unit of proportion used to express concentration that is corrected to a dry basis.

212 **220** **PEAK LOAD:** 100% of the manufacturer's design capacity of a gas turbine at 288° Kelvin, 60% relative humidity, and 101.3 kilopascals pressure (ISO 3977 standard ~~day~~ reference conditions and ratings).

213 **221** **PROCESS HEATER:** An enclosed combustion device that uses controlled flame to transfer heat to a process fluid or a process material that is not a fluid or to heat transfer material for use in a process unit (not including the generation of steam). A process heater may be either indirect or direct-fired, dependent upon whether the gases of combustion mix with and exhaust to the same stack or vent (direct-fired) with gases emanating from the process material or not (indirect-fired). Emissions from indirect-fired units consist entirely of products of combustion while emissions from direct-fired units are unique to the given process and may vary widely in any industrial process. A process heater is not an oven or kiln used for drying, curing, baking, cooking, calcining, or vitrifying.

214 **222** **RATED HEAT INPUT CAPACITY:** The heat input capacity ~~in million Btu/hr.~~ as specified on the nameplate of the combustion unit. If the combustion unit has been altered or modified so that its maximum heat input is different than the heat input capacity on the

nameplate (design heat capacity), the maximum heat input shall be considered as the rated heat input capacity.

215 ~~REGENERATIVE CYCLE GAS TURBINE: Any stationary gas turbine that recovers thermal energy from the exhaust gases and utilizes the thermal energy to preheat air prior to entering the combustor unit.~~

216 ~~RESIDUAL OIL: The heavier oils that remain after the distillate oils and lighter hydrocarbons are distilled off in refinery operations. This includes crude oil or fuel oil numbers 1 and 2 that have a nitrogen content greater than 0.05% by weight, and all fuel oil numbers 4, 5 and 6, as defined by the American Society of Testing and Materials in ASTM D396-01, "Standard Specifications for Fuel Oils".~~

217 ~~SIMPLE CYCLE GAS TURBINE: Any stationary gas turbine that does not recover heat from the gas turbine exhaust gases to preheat the inlet combustion air to the gas turbine, or that does not recover heat from the gas turbine exhaust gases to heat water or generate steam.~~

218 **223 STATIONARY GAS TURBINE:** Any simple cycle gas turbine or regenerative gas turbine that is not self-propelled or that is attached to a foundation.

219 ~~STEADY STATE: A safe, stable megawatt load at which a unit with equipment in normal operating conditions is capable of being held for an extended period of time, without creating an unsafe or unstable operating condition.~~

220 **224 STEAM GENERATING UNIT:** An external combustion unit or boiler fired by fossil fuel that is used to generate hot water or steam. The hot water or steam is then used as energy for driving another process or piece of equipment. A device that combusts any fossil fuel or alternative fuel and produces steam or heats water or heats any heat transfer medium.

221 **225 SULFUR OXIDES (SO<sub>x</sub>):** The sum of the oxides of sulfur emitted from the flue gas from a combustion unit that are directly dependent upon the amount of sulfur in the fuel used.

222 **226 ULTRA LOW SULFUR ~~DIESEL~~ OIL:** Fuel oil containing less than or equal to 0.0015 % sulfur by weight.

223 **227 UNCOMBINED WATER:** Condensed water containing no more than analytical trace amounts of other chemical elements or compounds.

224 **228 WASTE DERIVED FUEL GAS:** A gaseous fuel that is generated from the biodegradation of solid or liquid waste including, but not limited to, digester gas and landfill gas.

225 **229 WATER HEATER:** A closed vessel in which water is heated by combustion of fuel and water is either withdrawn for use external to the vessel (at pressures not exceeding 160 psi with all controls and devices preventing water temperatures from exceeding 210°F) or used for radiant heat. Water heaters are usually no larger than 1 MM Btu/hr ~~as opposed to boilers, and do not reach temperatures of 220°F and higher that boilers can reach, and are not manufactured to meet boiler codes.~~

## SECTION 300 – STANDARDS

**301 LIMITATIONS – PARTICULATE MATTER:** An owner or operator of any combustion unit with either a rated heat input capacity or heat input greater than 100 MMBtu/hr shall not discharge, cause, or allow the discharge of particulate matter emissions, caused by combustion of non-gaseous liquid fuels or a blend of liquid fuels with other fuels, in excess of 0.10 pounds/MMBtu.

~~301.1 Limitation-Liquid Fuels: An owner or operator shall not discharge, cause or allow the discharge of particulate matter emissions, caused by combustion of non-gaseous liquid fuels or a blend of liquid fuels with other fuels in excess of 0.10 lbs. per MMBtu, during steady state operations, from any combustion units listed in Sections 102.1, 102.3, and 102.4 of this rule with either a rated heat input capacity or heat input of greater than 100 MM Btu/hr.~~

~~301.2 Particulate Matter Testing: A backhalf analysis shall be performed, using Reference Method 202 referenced in Section 504.6 of this rule, each time a compliance test for particulate matter emissions to meet the standards in Section 301.1 of this rule is performed using Method 5. (The results of the Method 202 testing shall be used for emissions inventory purposes).~~

~~301.3 Good Combustion Practices for Turbines: During steady state operations, an owner or operator of a stationary gas turbine listed in Section 102.2 of this rule, regardless of fuel type or size, shall use operational practices recommended by the manufacturer and parametric monitoring that ensure good combustion control. One of the following procedures may be used:~~

- ~~a. Monitor the maximum temperature differential across the combustion burners or at locations around the back end of the turbine, dependent upon the particular unit, to ensure no more than a 100° F difference using a thermocouple. Differential temperatures across the burners to demonstrate good combustion practices shall be measured from at least one minute data point during a complete steady state operating hour. If a valid maximum temperature differential of greater than 100°F is observed across the burners, investigation and corrective action shall be taken within three hours to reduce the temperature difference to 100°F or less; or~~
- ~~b. If the manufacturer recommends that the maximum numerical temperature differential to ensure good combustion is a temperature that is greater than 100°F, then proof of this maximum alternate temperature shall be submitted to the Control Officer. The procedure to measure the maximum temperature differential listed above in Section 301.3(a) of this rule shall then be followed using the alternate recommended maximum temperature differential after approval by the Control Officer.~~
- ~~c. If a repetitive pattern of failure to meet the proper temperature differential of 100°F or to meet the alternate temperature differential recommended by the manufacturer indicates that the turbine is not being operated in a manner consistent with good combustion practices, then the Control Officer may require the owner or operator to submit a Corrective Action Plan (CAP).~~

**302 LIMITATIONS – OPACITY:** An owner or operator shall not discharge into the ambient air from any single source of emissions any air contaminant, other than uncombined water, in excess of 20% opacity.

**303 LIMITATIONS – SULFUR IN FUEL:** An owner or operator of any ~~applicable equipment listed in Section 102 of this rule~~ combustion unit that burns ~~liquid fuel oil or a mixture or blend of fuel oil with any other fuels~~ shall use only ultra low sulfur ~~diesel oil~~. An existing supply of low sulfur oil purchased or obtained prior to November 2, 2016 may be used until depleted. An owner or operator ~~using~~ of any combustion unit that burns waste derived fuel gas shall use only waste derived fuel gas that contains no more than 0.08% sulfur by weight, alone or in combination with other fuels.

**304 LIMITATIONS – NITROGEN OXIDES:** An owner or operator of any combustion unit shall comply with the subsections specified in Table 323-1.

**TABLE 323-1**

<b><u>FOR COMBUSTION UNITS THAT ARE NOT LOCATED AT A MAJOR SOURCE OF NITROGEN OXIDES:</u></b>	<b><u>THE OWNER OR OPERATOR SHALL COMPLY WITH:</u></b>
<u>Stationary gas turbines</u>	<u>304.1 and 304.2</u>
<u>Combustion units (&gt;100 MMBtu/hr) except stationary gas turbines</u>	<u>304.3</u>
<u>Combustion units (≤ 100 MMBtu/hr) except stationary gas turbines</u>	<u>304.1 or 304.2 or 304.4*</u>
<b><u>FOR COMBUSTION UNITS THAT ARE LOCATED AT A MAJOR SOURCE OF NITROGEN OXIDES:</u></b>	<b><u>THE OWNER OR OPERATOR SHALL COMPLY WITH:</u></b>
<u>Stationary gas turbines</u>	<u>304.1 and 304.2</u>
<u>Combustion units (&gt; 100 MMBtu/hour) except stationary gas turbines</u>	<u>304.3</u>
<u>Combustion units (&gt; 50 MMBtu/hour and ≤ 100 MMBtu/hour) except stationary gas turbines</u>	<u>304.2</u>
<u>Combustion units (&gt; 10 MMBtu/hour and ≤ 50 MMBtu/hour with annual heat input ≥ 220,000 therms) except stationary gas turbines</u>	<u>304.2 or 304.4*</u>
<u>Combustion units (&gt; 10 MMBtu/hour and ≤ 50 MMBtu/hour with annual heat input &lt; 220,000 therms) except stationary gas turbines</u>	<u>304.1 or 304.2 or 304.4*</u>

\* The RACT tuning procedures in Section 304.4 are not appropriate for combustion units equipped with Low-NO<sub>x</sub> burners or burners utilizing a premix flame.

~~304.1 An owner or operator of any combustion equipment listed in Section 102 of this rule, except gas turbines, with a heat input of greater than 10 MMBtu/hr to 100 MMBtu/hr shall comply either with Sections 304.1(a) or 304.1(b) of this rule. Gas turbines are subject to both Sections 304.1(a) and 304.1(b) of this rule below:~~

**304.1 Baseline Monitoring and Annual Tuning:**

**a.** Establish and record the initial optimal baseline concentrations for NO<sub>x</sub> and CO within 90 days of the first usage of the combustion ~~equipment~~ unit utilizing the initial design burner specifications or manufacturer’s recommendations to ensure

a:

good combustion practices. The initial design burner specifications or manufacturer's recommendations shall be kept onsite and available to the Control Office upon request.

- b. Tune the combustion unit annually in accordance with ~~good combustion practices or follow the manufacturer's recommended procedure, if applicable.~~ The manufacturer's recommended procedures shall be kept onsite and available to the Control Officer upon request. For low emission burner systems that do not provide accessibility for combustion chamber inspection, burner inspection, or inspection of the flame pattern, an owner or operator shall provide documentation from the manufacturer and follow the manufacturer's recommended procedure. ~~If using good combustion practices the manufacturer's recommended tuning procedure is not available,~~ the owner or operator shall tune the combustion unit annually ~~include the by following, at a minimum, the steps listed in 304.1b.(1) – (5), if the combustion unit is so equipped, and if such procedures are appropriate to the type of combustion unit:~~

- (1) Inspect the burner system and clean and replace any components of the burner as necessary to minimize emissions of NO<sub>x</sub> and CO; and
- (2) Inspect the burner chamber for areas of impingement and remove if necessary; and
- (3) Inspect the flame pattern and make adjustments as necessary to optimize the flame pattern; and
- (4) Inspect the system controlling the air-to-fuel ratio and ensure that it is correctly calibrated and functioning properly; and
- (5) ~~Measure the NO<sub>x</sub> and the CO concentration of the effluent stream after each adjustment was made with a handheld portable monitor to ensure optimal baseline concentrations are maintained.~~ Using a portable monitor, measure the NO<sub>x</sub> and CO concentration of the effluent stream after each adjustment is made to ensure optimal baseline concentrations are maintained.

b. **304.2 RACT Emission Limits:** Limit nitrogen oxide emissions to no more than the following amounts:

(+) a. Stationary Gas Turbines:

- (1) ~~42 ppmv~~ 42 ppmvd corrected to 15% oxygen calculated as nitrogen dioxide, when burning gaseous fuel. ~~During steady state operations, this test result using EPA Reference Method(s) 7 or other EPA-approved test method designated by the Control Officer shall be based upon the arithmetic mean of the results of three test runs. Each test run shall have a minimum sample run time of one hour.~~
- (2) ~~65 ppmv~~ 65 ppmvd corrected to 15% oxygen calculated as nitrogen dioxide, when burning liquid fuel. ~~During steady state operations, this test result using EPA Reference Method(s) 7 or other EPA-approved test method designated by the Control Officer shall be based upon the arithmetic mean of the results of three test runs. Each test run shall have a minimum sample run time of one hour.~~

**b. All Combustion Units Except Stationary Gas Turbines:**

**(1) 30 ppmvd corrected to 3% oxygen calculated as nitrogen dioxide, when burning gaseous fuel.**

**(2) 40 ppmvd corrected to 3% oxygen calculated as nitrogen dioxide, when burning liquid fuel.**

e. ~~For simple gas turbines, the nitrogen oxides shall be measured dry and corrected to 15% oxygen, during steady state operations. For all other combustion equipment, the nitrogen oxides shall be measured dry and corrected to 3% oxygen.~~

304.2

**304.3 Semi-Annual Tuning and RACT Emission Limits:** ~~An owner or operator of any combustion equipment, listed in Section 102 of this rule, with a heat input greater than 100 MMBtu/hr, shall:~~

a. ~~Tune the equipment combustion unit every 6 months in accordance with good combustion practices or a the manufacturer's recommended procedure that at a minimum includes the or in accordance with the procedures listed in Section 304.1(a) 304.1.b(1) through (5) of this rule and;~~

b. ~~Meet the NO<sub>x</sub> RACT emission limits as stated in Section 304.1(b) 304.2 of this rule.~~

**304.4 RACT Tuning Procedures:** Tune the combustion unit every 12 months using the procedure in Appendix A of this rule that is appropriate for the combustion unit.

305

**LIMITATIONS-CARBON MONOXIDE:** ~~An owner or operator of any equipment listed in Section 102 of this rule combustion unit with a heat input greater than 100 MMBtu/hr shall not cause to be discharged into the atmosphere, carbon monoxide (CO), measured in excess of 400 ppmv ppmvd corrected to 15% oxygen for Stationary Gas Turbines, and corrected to 3% oxygen for all Combustion Units Except Stationary Gas Turbines. at any time. During steady state operations, this test result, using EPA Reference Method 10 or other EPA-approved test method designated by the Control Officer, shall be based upon the arithmetic mean of the results of three test runs and shall be measured during steady state compliance source testing. Each test run shall have a minimum sample time of one hour. For simple gas turbines, the CO shall be measured dry and corrected to 15% oxygen, during steady state operations. For all other combustion equipment, the CO shall be measured dry and corrected to 3% oxygen.~~

306

**GOOD COMBUSTION PRACTICES FOR STATIONARY GAS TURBINES:** The owner or operator of any stationary gas turbine listed in Section 102.2 of this rule shall, regardless of fuel type, use operational practices recommended by the manufacturer to ensure good combustion control. The owner or operator of any stationary gas turbine listed in Section 102.2 of this rule shall demonstrate good combustion control using the parametric monitoring method listed below, or by operating a continuous emissions monitoring system to demonstrate compliance with the limits in Sections 304 and 305 of this rule, as applicable.

**306.1** Monitor the maximum temperature differential across the combustion burners or at locations around the back end of the turbine, dependent upon the particular unit, to ensure no more than a 100°F difference using a thermocouple. Differential

temperatures shall be measured and recorded at least once during every operating hour. If a temperature differential of greater than 100°F is observed across the burners, investigation and corrective action shall be taken within three hours to reduce the temperature difference to 100°F or less.

**306.2** If the manufacturer recommends that the maximum numerical temperature differential to ensure good combustion is greater than 100°F, then proof of this maximum alternate temperature differential shall be submitted to the Control Officer. The procedure to measure the maximum temperature differential listed in Section 306.1 of this rule shall then be followed using this alternate recommended maximum temperature differential after approval by the Control Officer.

**306.3** If the differential temperature exceeds 100°F, or the alternate temperature differential recommended by the manufacturer and approved by the Control Officer, during three consecutive operating hours, the operator shall comply with the recordkeeping requirements in Section 501.3 of this rule. If this occurs more than 3 times in 3 months, the owner or operator shall notify the Control Officer in writing within 2 business days and the Control Officer shall require the owner or operator to submit a Corrective Action Plan (CAP).

306 **307** ~~REQUIREMENTS FOR AIR POLLUTION CONTROL EQUIPMENT ECS AND ECS MONITORING EQUIPMENT: If an ECS is operated during a performance test required by Section 503 of this rule, the owner or operator shall:~~

~~306.1 Emission Control System: For affected operations which may exceed any of the applicable standards set forth in Sections 300 of this rule, an owner or operator may comply by installing and operating an emission control system (ECS) or a combustion control system which reduces emissions to below the applicable standards in Section 300 of this rule.~~

306.2 **307.1** ~~Providing and Maintaining ECS Monitoring Devices: An owner or operator required to use an approved ECS pursuant to this rule shall not do so without first providing, properly installing, operating, and maintaining~~ Properly install, operate, and maintain in calibration and in good working order, devices for indicating temperatures, pressures, transfer rates, rates of flow, or other operating conditions necessary to determine if air pollution control equipment is functioning properly and is properly maintained as described in an approved Operation and Maintenance (O&M) Plan.

~~306.3 O&M Plan Required for ECS:~~

- ~~a. General Requirements: An owner or operator shall provide and maintain an O&M Plan for any ECS, any other emission processing equipment, and any ECS monitoring devices that are used pursuant to this rule or an air pollution permit.~~
- ~~b. Approval by Control Officer: An owner or operator shall submit to the Control Officer for approval the O&M Plans of each ECS and each ECS monitoring device that is used pursuant to this rule.~~
- ~~c. Initial Plans: An owner or operator that is required to have an O&M Plan pursuant to this rule shall comply with all O&M Plans that the owner or operator has submitted for approval, but which have not yet been approved, unless notified by the Control Officer in writing. Once the initial plan has been~~

approved in writing by the Control Officer, an owner or operator shall comply with this approved plan:

- d. ~~Revisions to Plan: If revisions to the initial plan have been approved by the Control Officer in writing, an owner or operator shall comply with the revisions to the initial plan. If revisions to the plan have not yet been approved by the Control Officer in writing, then an owner or operator shall comply with the most recent O&M plan on file at Maricopa County Air Quality Department.~~
- e. ~~Control Officer Modifications to Plan: After discussion with the owner or operator, the Control Officer may modify the plan in writing prior to approval of the initial O&M plan. An owner or operator shall then comply with the plan that has been modified by the Control Officer.~~

**307.2** Submit to the Control Officer for approval an Operation and Maintenance (O&M) Plan for any ECS and any ECS monitoring devices that are used pursuant to this rule or to an air pollution permit. The O&M Plan shall include:

- a. ECS equipment manufacturer; and
- b. ECS equipment model; and
- c. ECS equipment identification number; and
- d. Operating parameters that will be monitored to demonstrate continued operation of the ECS in the manner the ECS was operated during the most recent performance test; and
- e. The manufacturer's recommended maintenance procedures and frequencies or, if the manufacturer's recommended maintenance procedures are not available, a maintenance plan based on good engineering practice to reduce emissions.

**307.3** Provide and maintain readily available on-site at all times the O&M Plan(s) for any ECS and ECS monitoring devices that are used under this rule or an air pollution control permit.

**307.4** Fully comply with all the identified actions and schedules provided in the most recent version of the O&M Plan submitted to the Control Officer, unless notified by the Control Officer in writing.

**307.5** Submit a revised O&M Plan within 30 business days following receipt of the Control Officer's notice that an O&M Plan for any ECS, including any ECS monitoring device, is deficient or inadequate.

**308** **EMERGENCY FUEL USE NOTIFICATION:** Each time a combustion unit is fired with emergency fuel, the owner or operator shall provide written notification to the Control Officer within 2 business days after combustion of emergency fuel begins. The written notification shall include a description of the emergency that necessitated the use of emergency fuel, the date that combustion of emergency fuel began, and the expected duration of the emergency fuel usage. The written notification may be submitted by mail, email, fax, commercial delivery, or hand delivery.

## **SECTION 400 – ADMINISTRATIVE REQUIREMENTS**

**401 COMPLIANCE SCHEDULE FOR PERFORMANCE TESTING:** The owner or operator of any combustion unit that becomes subject to the emission limits in Section 304.2 of this rule on or after June 23, 2021 shall comply with following compliance schedules, as applicable, and the associated deadlines for demonstrating compliance.

**401.1 401.1 Performance Test:** The owner or operator shall demonstrate compliance with the applicable emission limits within 6 months after the combustion unit becomes subject to the emission limits in Section 304.2 of this rule. This requirement shall not apply to a combustion unit if modifications to an ECS or installation of an ECS is required to achieve compliance with the applicable emission limits and the owner or operator is in compliance with the applicable schedule in Section 401.3 or 401.4 of this rule.

**401.1 401.2 O&M Plan:** ~~Any owner or operator employing an approved ECS on the effective date of this rule~~ If different operating parameters or ECS maintenance procedures or schedules are used to achieve compliance with the emission limits in Section 304.2 of this rule, the owner or operator of the combustion unit shall by July 2, 2017 file an submit a revised O&M Plan with the Control Officer in accordance with Section 306.3 307 of this rule within 30 days after completion of the performance test required by Section 401.1 of this rule.

**401.2 401.3 Modifications to Existing ECS:** ~~Any owner or operator required to modify their~~ If it is necessary to modify an ECS equipment or system by either reconstructing or adding on equipment for compliance with this rule, an owner or operator shall by July 2, 2017 file a schedule for the modification with submit to the Control Officer a schedule for modification of the ECS within 6 months after the combustion unit becomes subject to the emission limits in Section 304.2 of this rule. The plan schedule shall show how the ECS is to be used to achieve full compliance and shall specify dates for completing increments of progress. Any and all ECS used to achieve such compliance shall be in operation by November 2, 2018. The owner or operator shall complete ECS modifications and demonstrate compliance with the applicable NO<sub>x</sub> emission limits within 12 months after the combustion unit becomes subject to the emission limits in Section 304.2 of this rule.

**401.3 401.4 ECS Installation:** ~~An owner or operator required to install~~ If installation of an ECS for is necessary to achieve compliance with numeric emission limits in this rule, an owner or operator shall by July 2, 2017 file a schedule for the installation with submit to the Control Officer a schedule for installation of the ECS within 6 months after the equipment becomes subject to the emission limits in Section 304.2 of this rule. The ECS shall then be installed and in compliance by November 2, 2019. The owner or operator shall complete the installation of an ECS and demonstrate compliance with the applicable NO<sub>x</sub> emission limits within 36 months after the combustion unit becomes subject to the emission limits in Section 304.2 of this rule.

**402 COMPLIANCE SCHEDULE FOR RACT TUNING PROCEDURE:** The owner or operator of any combustion unit that becomes subject to the requirements of Section 304.4 of this rule on or after June 23, 2021 shall complete the RACT tuning procedure within 6 months after the combustion unit becomes subject to Section 304.4 of this rule.

## SECTION 500 – MONITORING AND RECORDS

**501 RECORDKEEPING AND REPORTING:** An owner or operator ~~subject to this rule of a combustion unit~~ shall comply with the requirements set forth in this section. Any records and data required by this section shall be kept on site at all times in a consistent and complete manner and be made available without delay to the Control Officer or his designee upon request. Records shall consist of the following information:

**501.1 ~~Equipment Listed in Section 102 of this Rule~~ Combustion Units:** ~~Monthly records of type and amount~~ Type of fuel used, amount of fuel used, and amount of the sulfur content of any liquid fuel or waste derived fuel gas combusted in the fuel if using liquid fuel, and the days and hours of operation.

**501.2 Emergency Fuel Usage:** Monthly records of type and amount of emergency fuel used, the sulfur content of the fuel, dates and hours of operation using emergency fuel, and nature of the emergency or purpose for the use of the emergency fuel as stated in Sections ~~104.1 and 104.2 and 104.3~~. Yearly records of the twelve month log of hours of operation ~~in the emergency mode~~ using emergency fuel.

**501.3 Good Combustion Practice:** Measurements of the temperature differential across the burners of turbines per Section ~~301.3~~ 306 of this rule, results of evaluation and corrective action taken to reduce the temperature differential or a finding that the temperature differential returned to the range listed in Sections ~~301.3(a)~~ 306.1 or ~~301.3(b)~~ 306.2 of this rule without any action by the owner or operator.

**501.4 Baseline Monitoring and Annual Tuning Procedure:** Date that the procedure was performed on the particular combustion unit and at a minimum: stack gas temperature, flame conditions, nature of the adjustment and results of the nitrogen oxide and carbon monoxide concentrations obtained by using a ~~handheld~~ portable monitor after each adjustment.

**501.5 RACT Tuning Procedure:** Date the procedure was performed, the final control settings that reflect optimized combustion, the firing rate during the tuning procedure, a record of all adjustments and cleaning procedures, and a record of all operating parameters specified in Appendix A.

**501.6 Operation & Maintenance Records:** On each day an ECS operates, record the ECS operating parameters described in the O&M Plan. Record all maintenance actions taken within 24 hours of maintenance completion. An explanation shall be recorded for any scheduled maintenance that is not performed during the period designated in the O&M Plan.

**501.7 Continuous Emission Monitoring Systems:** All CEMS measurements, results of CEMS performance evaluations, CEMS calibration checks, and adjustments and maintenance performed on these systems.

**502 RECORDS RETENTION:** Copies of reports, logs and supporting documentation required by the Control Officer shall be retained for at least 5 years. Records and information required by this rule shall also be retained for at least 5 years.

**503 COMPLIANCE ~~DETERMINATION~~ DEMONSTRATION:**

**503.1 ~~Sulfur In-Fuel~~ Sulfur Verification:**

- a. **Ultra Low Sulfur Oil:** If the Control Officer requests documentation of the sulfur content of the fuel to demonstrate the 0.0015% limit, the owner or operator shall submit one of the following:
  - (1) Fuel receipts, or
  - (2) Contract specifications, or
  - (3) Pipeline meter tickets, or
  - (4) Fuel supplier information, or
  - (5) Purchase records, or
  - (6) ~~Test results of the fuel for sulfur content~~ Analytical results listing the sulfur content of the fuel, the test method conducted, and evidence that appropriate chain of custody procedures were followed.

The items listed above must provide accurate sulfur content values ~~or~~ and be based on enforceable test methods as approved by the Administrator to determine the sulfur content.

- b. **Waste Derived Fuel Gas:** The owner or operator shall submit documentation ~~of the concentration~~ of the sulfur ~~level~~ content of the waste derived fuel gas to the Control Officer upon request. The sulfur content of gaseous fuels shall be determined by South Coast Air Quality Management District Method 307-91 Determination of Sulfur in a Gaseous Matrix.
- c. **Purchase Documentation of Existing Low Sulfur Oil:** The owner or operator shall maintain documentation of the purchase date of any low sulfur oil on site to demonstrate the oil was purchased prior to November 2, 2016.

**503.2 Gaseous Emissions-Source Test Requirements:** ~~Boilers with a heat input capacity of 100 MMBtu per hour or greater, must conduct all applicable performance (stack) tests on a triennial basis. Triennial performance tests must be completed no more than 37 months after the previous performance test. The owner or operator of any combustion unit that is subject to numeric emission limits in Section 301, 304 and/or 305 of this rule shall conduct performance tests at least once every 5 years. The result of the performance test shall be the arithmetic mean of the results of three test runs. Each test run shall have a minimum sample time of one hour. In addition, the owner or operator shall comply with the following requirements:~~

- a. Nitrogen oxides shall be measured using EPA Reference Method 7 or 7E and carbon monoxide shall be measured using EPA Reference Method 10, as incorporated by reference in Section 504 of this rule. For stationary gas turbines, nitrogen oxides and carbon monoxide shall be measured dry and corrected to 15% oxygen. For all other combustion units, nitrogen oxides and carbon monoxide shall be measured dry and corrected to 3% oxygen.
- b. Particulate matter shall be measured using EPA Reference Method 5, or another EPA-approved test method designated by the Control Officer. A back-half analysis shall be performed using Reference Method 202 each time a performance test is required.

- c. The owner or operator may demonstrate compliance with applicable emission limits by conducting representative performance testing if all of the following requirements are satisfied:
  - (1) All combustion units in the specified group were produced by the same manufacturer, have the same model number or other manufacturer's designation in common, and have the same rated heat input capacity and operating specifications;
  - (2) All combustion units in the specified group are operated and maintained in a similar manner;
  - (3) At least one combustion unit or one-third of the combustion units in the specified group, whichever is greater, are tested each time a performance test is required;
  - (4) Each time a performance test is required, different combustion units are tested so that all combustion units in the specified group are tested before any combustion units in the specified group are retested; and
  - (5) If emissions from any combustion unit in the specified group exceed an applicable emission limit the owner or operator shall conduct a performance test on each unit in the specified group to demonstrate that each combustion unit in the specified group is in compliance with the applicable emission limit.

### 503.3 Gaseous Emissions-Continuous Emission Monitoring System (CEMS):

Compliance with the emission requirements specified in Sections 301 through ~~304~~ 305 of this rule may also be determined using CEMS. Where the combustion unit(s) are equipped with CEMS:

- a. **General:** All CEMS must be installed according to the procedures specified in 40 CFR 60.13(g). All CEMS shall be installed such that a representative measurement of emissions is obtained. Additional procedures for the location of CEMS found in 40 CFR 60, Appendix B shall be used. The data recorder for CEMS shall be in operation at all times the combustion unit is operated.
- b. **Cycle Time:** An owner or operator of any combustion unit using a CEMS shall ensure that the CEMS completes a minimum of one cycle of operation (sampling, analyzing, and data recording) for each successive 15-minute period.
- c. **Calibration:** Zero and span shall be checked once every 24 hours. The CEMS shall be calibrated in accordance with the manufacturer's specifications.
- d. **Averaging:** The data recorded during periods of calibration checks, zero and span adjustments shall not be included in averaging for compliance determinations. Compliance shall be determined on an hourly basis using the average of the ~~3~~ three previous ~~1~~ 1-hour average emissions concentrations. The 1-hour average emissions concentration shall be determined from at least two data points recorded by the CEMS.
- e. ~~Accuracy Testing~~ **Quality Assurance:** ~~Accuracy testing of~~ The owner or operator of the CEMS shall be conducted using a relative accuracy test audit pursuant to fully comply with 40 CFR 60, Appendix F.

**504 COMPLIANCE DETERMINATION-TEST METHODS INCORPORATED BY**

**REFERENCE:** The following test methods are approved for use for the purpose of determining compliance with this rule. The test methods are incorporated by reference in Rule 360 and Appendix G of the Maricopa County Air Pollution Control Regulations. Alternative test methods as approved by the Administrator or other EPA-approved test methods may be used upon written approval from the Control Officer. When more than one test method is permitted for the same determination, an exceedance under any method will constitute a violation. Copies of test methods referenced in this section are available at the Maricopa County Air Quality Department.

- 504.1** EPA Reference Methods 1 (“Sample and Velocity Traverses for Stationary Sources”), and 1 A (“Sample and Velocity Traverses for Stationary Sources with Small Stacks and Ducts”) (40 CFR 60, Appendix A).
- 504.2** EPA Reference Methods 2 (“Determination of Stack Gas Velocity and Volumetric Flow Rate”), 2A (“Direct Measurement of Gas Volume through Pipes and Small Ducts”), 2C (“Determination of Stack Gas Velocity and Volumetric Flow Rate in Small Stacks or Ducts”), and 2D (“Measurement of Gas Volumetric Flow Rates in Small Pipes and Ducts”) (40 CFR 60, Appendix A).
- 504.3** EPA Reference Methods 3 (“Gas Analysis for the Determination of Dry Molecular Weight”), 3A (“Determination of Oxygen and Carbon Dioxide Concentrations in Emissions from Stationary Sources (Instrumental Analyzer Procedure)”), 3B (“Gas Analysis for the Determination of Emission Rate Correction Factor ~~of~~ or Excess Air”), and 3C (“Determination of Carbon Dioxide, Methane, Nitrogen and Oxygen from Stationary Sources”) (40 CFR 60, Appendix A).
- 504.4** EPA Reference Method 4 (“Determination of Moisture Content in Stack Gases”) (40 CFR 60, Appendix A).
- 504.5** EPA Reference Method 5 (“Determination of Particulate Emissions from Stationary Sources”) (40 CFR 60, Appendix A).
- 504.6** EPA Reference Method 202 (“Dry Impinger Method for Determination of Condensable Particulate Emissions from Stationary Sources”) (40 CFR 51, Appendix M).
- 504.7** EPA Reference Methods 7 (“Determination of Nitrogen Oxide Emissions from Stationary Sources”), ~~7A (“Determination of Nitrogen Oxide Emissions from Stationary Sources”), 7B (“Determination of Nitrogen Oxide Emissions from Stationary Sources – Ultraviolet Spectrometry”), 7C (“Determination of Nitrogen Oxide Emissions from Stationary Sources – Alkaline Permanganate Colorimetric Method”), 7D (“Determination of Nitrogen Oxide Emissions from Stationary Sources – Alkaline Permanganate Chromatographic Method”),~~ and 7E (“Determination of Nitrogen Oxide Emissions from Stationary Sources – Instrumental Analyzer ~~Method~~ Procedure”), (40 CFR 60, Appendix A).
- 504.8** EPA Reference Method 9, (“Visual Determination of the Opacity of Emissions from Stationary Sources”) (40 CFR 60, Appendix A).
- 504.9** EPA Reference Method 10, (“Determination of Carbon Monoxide from Stationary Sources”) (40 CFR 60, Appendix A).

- 504.10** EPA Reference Method 20, (“Determination of Nitrogen Oxides, Sulfur Dioxide, and Diluent Emissions from Stationary Gas Turbines”) (40 CFR 60, Appendix A).
- 504.11** ASTM Method ~~D2622-98~~ D2622-05, (“Standard Test Method for Sulfur in Petroleum Products by Wavelength Dispersive X-Ray Fluorescence Spectrometry”).
- 504.12** ASTM Method D2880-96 (“Standard Specification for Gas Turbine Fuel Oils”).
- 504.13** ASTM Method D4294-02 or D4294-03, (“Standard Test Method for Sulfur in Petroleum and Petroleum Products by Energy-Dispersive X-Ray Fluorescence Spectrometry”).
- 504.14** ASTM Method D5504-01 or D5504-08, (“Standard Test Method for Determination of Sulfur compounds in Natural Gas and Gaseous Fuels by Gas Chromatography and Chemiluminescence”).
- 504.15** South Coast Air Quality Management District Method ~~307-94~~ 307-91 (“Determination of Sulfur in a Gaseous Matrix”), revised 1994.

**APPENDIX A TO RULE 323**  
**RACT TUNING PROCEDURES**

Nothing in these equipment tuning procedures shall be construed to require any act or omission that would result in unsafe conditions or would be in violation of any regulation of requirement established by Factory Mutual, Industrial Risk Insurers, National Fire Prevention Association, the Industrial Commission of Arizona (Arizona Division of Occupational Safety and Health), the Federal Occupational Safety and Health Administration, or other relevant regulations and requirements. Steps in these procedures that are not applicable to specific combustion units may be omitted.

**Tuning Procedure for Forced Draft Fired Boilers, Steam Generating Units, and Process Heaters:**

- 1. Operate the combustion unit at the firing rate most typical of normal operation. If the combustion unit experiences significant load variations during normal operation, operate it at its average firing rate.**
- 2. At this firing rate, record the stack gas temperature, oxygen concentration, and CO concentration (for gaseous fuels) or smoke-spot number<sup>1</sup> (for liquid fuels), and observe flame conditions after operation stabilizes at the firing rate selected. If the excess oxygen in the stack gas is at the lower end of the range of typical minimum values<sup>2</sup>, and if CO emissions are low and there is no smoke, the combustion unit is probably operating at near optimum efficiency at this particular firing rate. Complete the remaining steps in this procedure to determine whether still lower oxygen levels are practical.**
- 3. Increase combustion air flow to the furnace until stack gas oxygen levels increase by one to two percent over the level measured in Step 2 and record the stack gas temperature, oxygen concentration, CO concentration (for gaseous fuels) or smoke-spot number (for liquid fuels), and observe flame conditions for these higher oxygen levels after boiler operation stabilizes.**
- 4. Decrease combustion air flow until the stack gas oxygen concentration is at the level measured in Step 2. From this level, gradually reduce the combustion air flow, in small increments. After each increment, record the stack gas temperature, oxygen concentration, CO concentration (for gaseous fuels) and smoke-spot number (for liquid fuels). Also observe the flame and record any changes in its condition.**
- 5. Continue to reduce combustion air flow stepwise, until one of these limits is reached:**
  - a. Unacceptable flame conditions, such as flame impingement on furnace walls or burner parts, excessive flame carryover, or flame instability;**
  - b. Stack gas CO concentrations greater than 400 ppm;**
  - c. Smoking at the stack; or**

---

<sup>1</sup> The smoke-spot number shall be determined with ASTM D2156.

<sup>2</sup> Typical minimum oxygen levels for boilers firing at high firing rates are 0.5 – 3% (gaseous fuels) and 2 – 4% (liquid fuels).

- d. Equipment related limitations, such as low windbox/furnace pressure differential, built in air-flow limits, etc.
6. Develop an O<sub>2</sub>/CO curve (for gaseous fuels) or O<sub>2</sub>/smoke curve (for liquid fuels) using the excess oxygen and CO or smoke-spot number data obtained at each combustion air flow setting.
7. From the O<sub>2</sub>/CO curve or the O<sub>2</sub>/smoke curve, find and record the stack gas oxygen levels where the CO emissions or smoke-spot number equal the following values:

<u>Fuel</u>	<u>Measurement</u>	<u>Value</u>
<u>Gaseous</u>	<u>CO Emissions</u>	<u>400 ppm</u>
<u>#1 &amp; #2 oils</u>	<u>Smoke-spot number</u>	<u>Number 1</u>
<u>#4 oils</u>	<u>Smoke-spot number</u>	<u>Number 2</u>
<u>#5 oils</u>	<u>Smoke-spot number</u>	<u>Number 3</u>
<u>Other oils</u>	<u>Smoke-spot number</u>	<u>Number 4</u>

8. The stack gas oxygen level recorded in Step 7 is the minimum excess oxygen level (or the CO/smoke threshold). Compare the minimum excess oxygen level to the expected value provided by the combustion unit manufacturer. If the minimum level is found to be substantially higher than the value provided by the combustion unit manufacturer, burner adjustments can probably be made to improve fuel and air mixing, thereby allowing operation with less air.
9. Increase the minimum excess oxygen level identified in Step 7 by 0.5 to 2.0 percent and reset burner controls to operate automatically at this higher stack gas oxygen level. This margin above minimum oxygen level accounts for fuel variations, variations in atmospheric conditions, load changes, and nonrepeatability or play in automatic controls.
10. If the load of the combustion unit varies significantly during normal operation, repeat Steps 1 through 8 for firing rates that represent the upper and lower limits of the range of the load. Because control adjustments at one firing rate may affect conditions at other firing rates, it may not be possible to establish the optimum excess oxygen level at all firing rates. If this is the case, choose the burner control settings that give best performance over the range of firing rates. If one firing rate predominates, settings should optimize conditions at that firing rate.
11. Verify that the new settings can accommodate the sudden changes that may occur in daily operation without adverse effects. Do this by increasing and decreasing load rapidly while observing the flame and stack. If any of the conditions in Step 5 result, reset the combustion controls to provide a slightly higher level of excess oxygen. Verify the new settings in a similar manner. The final control settings that reflect combustion optimization shall be recorded for future reference.

## Natural Draft Fired Boilers, Steam Generating Units, and Process Heaters:

1. Verify that the combustion unit is operating at the lowest pressure or temperature setting that will satisfy load demand. This pressure or temperature will be used as a basis for comparative combustion analysis before and after tuning.
2. Verify that the combustion unit will operate for the minimum number of hours necessary to perform the tuning procedure.
3. Verify that the size of air supply openings is in compliance with applicable codes and regulations. Air supply openings must be fully open when the burner is firing and air flow must be unrestricted.
4. Verify that the vent is in good condition, properly sized, and free from obstruction.
5. Perform a combustion analysis at both high and low fire, if possible. Record the following data for each combustion analysis:
  - a. The concentration of CO and oxygen;
  - b. Inlet fuel pressure at burner at high and low firing rates;
  - c. Steam pressure, water temperature, process fluid temperature, or temperature entering and leaving the combustion unit; and
  - d. Inlet fuel use rate, if a meter is available.
6. Clean all dirty burners or burner orifices. Verify that fuel filters and moisture traps are in place, clean, and operating properly. Confirm proper location and orientation of burner diffuser spuds, gas canes, etc. Replace or repair damaged or missing burner parts.
7. Remove external and internal sediment and scale from heating surfaces.
8. Verify that the necessary water or process fluid treatment is being used. Confirm flushing and/or blowdown schedule.
9. Repair all leaks. In addition to the high-pressure lines, check the blow-off, drain, safety valve, bypass lines, and if used, the feed pump.
10. Perform the following safety checks:
  - a. Test primary and secondary low water level controls;
  - b. Check operating and limit pressure and temperature controls;
  - c. Check pilot safety shut off operation;
  - d. Check safety valve pressure setting and verify that the setting is consistent with load requirements; and
  - e. Check limit safety control and spill switch.
11. Adjust the combustion unit to fire at the maximum inlet fuel use rate; record fuel manifold pressure.

- 12.** Adjust draft and/or fuel pressure to obtain acceptable, clean combustion at high, medium, and low firing rates. The CO concentration should not exceed 400 ppm at 3% oxygen.
- 13.** Verify that light-offs are smooth and safe. Perform a reduced fuel pressure test at both high and low firing rates in accordance with the manufacturer's instructions.
- 14.** Check and adjust the modulation controller. Verify proper, efficient, and clean combustion through the range of firing rates. When optimum performance has been achieved, record all data.
- 15.** Perform a final combustion analysis on the warm combustion unit at high, medium, and low firing rates, if possible. Record data obtained from the combustion analysis as well as the following information:

  - a.** Inlet fuel pressure at burner at high and low firing rates;
  - b.** Pressure above draft hood or barometric damper at high, medium, and low firing rates.
  - c.** Steam pressure, water temperature, or process fluid pressure or temperature entering and leaving the combustion unit; and
  - d.** Inlet fuel use rate if a meter is available.